

# A historical overview of the classification of the Neotropical tribe Zammarini (Hemiptera, Cicadidae) with a key to genera

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## Abstract

An overview is given of the past century's confusions concerning some key characters within this Neotropical cicada tribe. The limits of the genera *Zammara* and *Orellana* have been redefined and a comprehensive checklist is included for the tribe. An illustrated key to the genera of the tribe Zammarini (Hemiptera: Cicadidae) is provided; this is the first key to both males and females of this tribe. *Odopoea perspicua* Distant, 1905 is transferred from Zammarini to the African tribe Platycleurini to become *Casualna perspicua* (Distant, 1905), **comb. n.**

## Resumen

Se presenta un resumen de las confusiones del siglo pasado sobre algunos caracteres importantes para la delimitación genérica de esta tribu de cigarras neotropicales. Se redefinen los límites taxonómicos de los géneros *Zammara* y *Orellana* y se provee una lista exhaustiva de especies pertenecientes a la tribu. Se incluye una clave ilustrada para los géneros de la tribu Zammarini (Hemiptera: Cicadidae); esta es la primera clave para machos y hembras de esta tribu. *Odopoea perspicua* Distant, 1905 es transferida de Zammarini a la tribu africana Platycleurini tomando la nueva combinación *Casualna perspicua* (Distant, 1905).

## Keywords

Zammarini, Hemiptera, Cicadidae, tarsomeres, Neotropical, identification key, taxonomy, Platycleurini

## Introduction

The Neotropical tribe Zammarini (Hemiptera: Cicadidae), belongs to the subfamily Cicadinae, the latter characterized by the presence of tymbal covers. Zammarini are easily recognizable by their strongly produced pronotal flanges. Males of this tribe have a more or less bulbous tymbal cover, which is sometimes useful as a specific character.

Over the past century, the tribe Zammarini has been studied and discussed by several hemipterists, probably because these cicadas are relatively large, colorful, and possess unique, strongly produced pronotal flanges.

This paper is the first one in a series of papers dealing with the taxonomy of the tribe Zammarini, with the ultimate goal of publishing a monograph on the tribe based on morphological, molecular, ecologic, biogeographic and acoustic data.

## History of the tribe

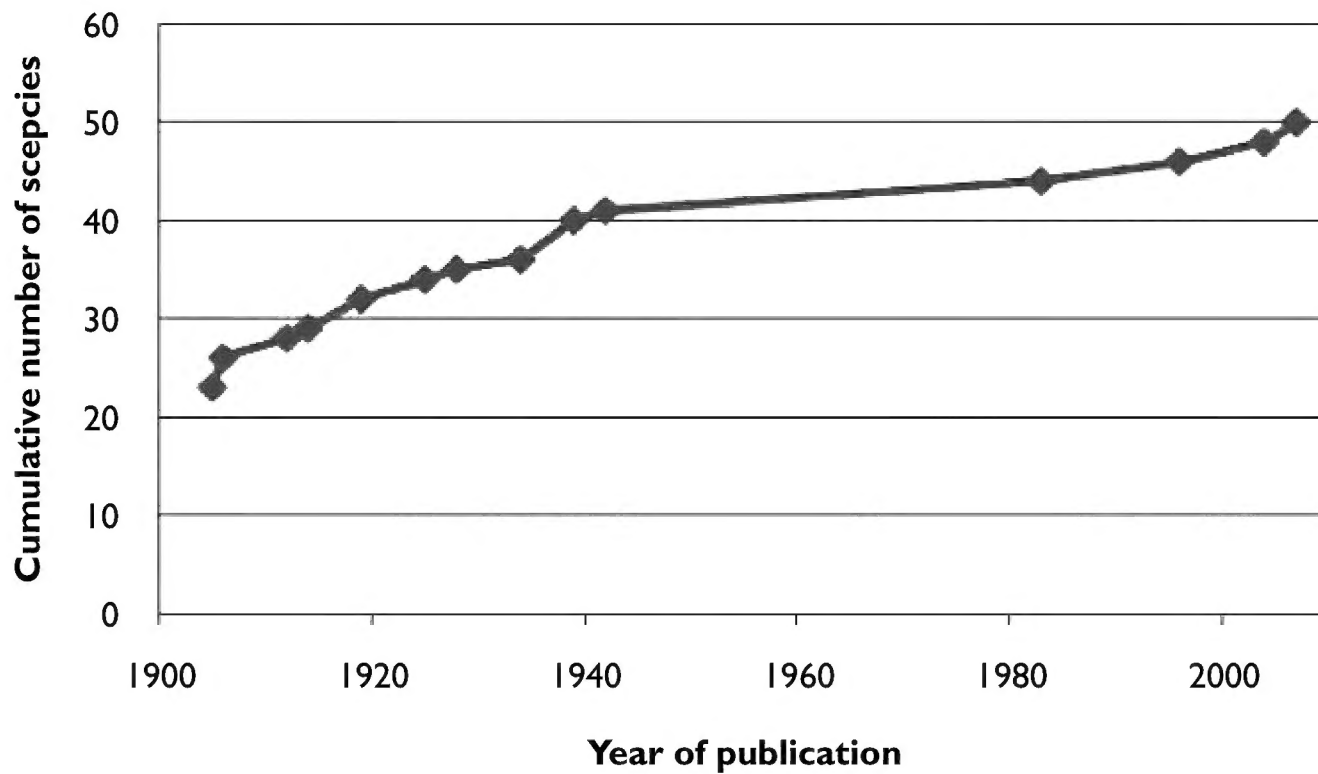
The tribe Zammarini was described by Distant (1905) under the “division” name Zammararia. Distant (1905) defined his Zammararia to consist of *Zammara* Amyot & Audinet Serville, 1843 (7 spp.), *Odopoea* Stål, 1861 (13 spp.), two new genera, *Orellana* and *Miranha*, which are based on respectively *Z. columbia* Distant, 1881 and *Z. imbellis* Walker, 1858, and two new species *Orellana brevis* and *Odopoea perspicua*. These 24 species attributed to 4 genera were catalogued a year later in Distant’s catalogue (1906a). In 1915, Van Duzee first used the tribal name Zammarini.

Distant (1912) described the genus *Uhleroides* as a new genus of Zammarini; *Uhleroides* is restricted to Cuba and Hispaniola. Without explanation, Kato (1932) transferred *Uhleroides* to the tribe Thophini. Moulds (2001) recently transferred *Uhleroides* back into Zammarini, based on the following characters: “the presence of transverse grooves towards the distal ends of the postclypeal ridges, an antennal plate that reaches almost to the eyes, fore wings which carry blotch-like infuscations at distal ends of apical veins 1–7 and at base of apical cells 2, 3 and 5, a narrow basal cell to the fore wing with veins M and CuA meeting the cell close together and a hind wing anal lobe that is narrow.”

Haupt (1918) and Delétang (1919) both described new genera within Zammarini (*Adusella* and *Edholmbergia*, respectively); however, both generic names were synonymized to *Odopoea* by Torres (1945). Distant (1920) described *Juanaria*, a monospecific Zammarini genus endemic to Cuba. Davis (1928, 1934) added two more genera to the tribe, *Borencona* (a monospecific genus endemic to Puerto Rico) and *Chinaria* (restricted to Mexico and the Dominican Republic).

The most recent generic addition to Zammarini was made by Boulard and Sueur (1996), who described the monospecific genus *Zammaralna* (a group endemic to Venezuela) as the “taxon frère de *Zammara*” [sister taxon to *Zammara*].

Following Distant’s (1905) raising of the tribe, additional new species were described by Distant (1906b, 1906c, 1912), Schmidt (1919), Goding (1925) Davis



**Figure 1.** Accumulation of species / publication year for the tribe Zammarini, since Distant recognized the tribe in 1905.

(1928, 1934, 1939, 1942), Ramos (1983), Boulard and Sueur (1996) and Sanborn (2004, 2007, in press). For an overview, see Figure 1 and Checklist. Thus, at present, the tribe Zammarini consists of 9 genera and 50 described species: *Odopoea* (15 species), *Miranha* (1), *Zammara* (15), *Zammaralna* (1), *Juanaria* (1), *Borencona* (1), *Chinaria* (4), *Orellana* (5), *Uhleroides* (7).

### Tarsomeres and head width: contradictions and confusions in the literature

The presence of 2 or 3 tarsomeres, a character that should be easy to evaluate, has led to considerable confusion within Zammarini. Within Cicadidae, a reduction of the number of tarsomeres is an unusual condition; indeed, within Zammarini, *Zammara* is the only genus with 2 tarsomeres instead of 3. Amyot and Audinet Serville (1843) originally described *Zammara* as having 2 or 3 tarsomeres; the type species, *Z. tympanum* (Fabricius, 1803), has 2 tarsomeres. The other species of *Zammara* described in this work, *Z. strepens*, was stated (erroneously) as having: “les tarsi distinctement de trois articles” [tarsi clearly three-jointed].

Distant (1881a) described *Z. columbia* as having 3 tarsomeres (in error). Later, Distant (1905) erected the genus *Orellana*, and assigned *Z. columbia* as the type species of this genus; oddly, he stated clearly in his generic description for *Orellana*: “tarsi two-jointed,” based on a type species that he previously described as having 3 tarsomeres. In this same publication, Distant described the species *Orellana brevis* as having “two-jointed tarsi.” One year later, Distant (1906a) transferred *Z. nigriplaga* Walker, 1858 to

the genus *Orellana* based on having the “head (including eyes) only about two-thirds the breadth of base of mesonotum” in contrast to “about as wide” for *Zammara*.

Jacobi (1907) suggested that both Distant (1881a), and Amyot and [Audinet] Serville (1843) made errors in interpreting tarsomere morphology for respectively, *Orellana columbia* and *Zammara strepens*. Jacobi implied that the errors might have been due to the “nicht ganz gutem lichte und geringeren optischen hilfsmitteln” [suboptimal lighting and inferior optical tools] than his “Zeisschen Binokularlupe mit 35facher vergrößerung.” [Zeiss dissecting microscope with 35× magnification]. He also transferred *O. nigriplaga* (Walker, 1858) back into *Zammara*.

Subsequently, Distant (1914) transferred *Z. nigriplaga* and *Z. brevis*, again, into *Orellana*, based on the breadth of the head (as discussed above) and because these species supposedly have 2 tarsomeres, since he described the genus *Orellana* again as having tarsi “two-jointed.”

Schmidt (1919) discussed Jacobi’s and Distant’s works and moved *Z. nigriplaga*, Walker 1858 and *O. brevis* Distant, 1905 (back) to *Zammara* because both species have 2 tarsomeres. He also moved *Z. strepens* Amyot & Audinet Serville, 1843 to *Orellana* and described the new species *Orellana bigibba*; additionally, Schmidt suggested that the genus description for *Orellana* should be changed to “tarsen dreigliedrich” [tarsi three-jointed].

Goding (1925) based the separation of *Zammara* and *Orellana* on Distant’s (1905) key to genera, namely “head (including eyes) only about two-thirds the breadth of base of mesonotum” for *Orellana* and “head (including eyes) about as wide as the breadth of base of mesonotum” for *Zammara*. Based on this separation, Goding transferred *Z. nigriplaga* and *Z. brevis* again into *Orellana* and described two more species in the genus: *O. pulla* and *O. brunneipennis*, not mentioning the number of tarsomeres for either species.

Boulard (1975, 1976) treated *O. brevis*, *O. bigibba* and *O. columbia* as belonging to *Zammara*, though without specifically transferring them back into *Zammara*. It is not clear whether, in doing this, he intended not to recognize *Orellana* as a valid genus, since by transferring *O. columbia* (the type species of *Orellana*) back to *Zammara*, *Orellana* would become a junior (subjective) synonym of *Zammara*.

Boulard and Sueur (1996) praised Distant for his insight in the importance of the number of tarsomeres as a generic character, and gave the example where he [Distant] used it to separate *Miranha* (trimère) and *Orellana* (dimère). So it can be assumed that Boulard (1975, 1976) did not intend to synonymize the genus *Orellana* with *Zammara*. Boulard and Sueur (1996) discussed the number of tarsomeres briefly when they erected the new genus *Zammaralna*, defining it in the following way: “Habitus de *Zammara*, mais tarsi à trois articles; nervures médiane et cubitale naissant du même angle de la cellule basale et poursuivant, juxtaposées, plus ou moins longuement (pas de tronc commun)” [Similar to *Zammara*, but with 3 tarsomeres; median and cubital veins arising at the same angle from the basal cell and from there on juxtaposed, over a more or less long distance (no common base)].

## Results

My research for the present paper proves that Jacobi (1907) was correct that the number of tarsomeres in the descriptions of *Orellana columbia* Distant, 1881 and *Zammara strepens* Amyot & Audinet Serville, 1843 are wrong and that in fact *Orellana columbia* has 3 tarsomeres, while *Zammara strepens* has 2 tarsomeres. Schmidt (1919) was also correct in that the genus description for *Orellana* should be changed to “tarsi three-jointed” (i.e. having 3 tarsomeres). Furthermore both *nigriplaga* and *brevis* should be transferred to *Zammara* because they each possess 2 tarsomeres. The species *bigibba* has 3 tarsomeres and therefore should stay in *Orellana*. I have not seen the types of *Orellana pulla*, Goding 1925 or *Orellana brunneipennis* Goding, 1925, nor specimens that belong to either of these species. Because the type specimens have not been located yet, the generic placement of the latter two species is tentative. This is especially so because Goding (1925) separated *Zammara* and *Orellana* based on the width of the head, a characteristic not valid to separate these genera. Distant (1905) described *Odopoea perspicua* and listed the type locality as “São Thomé”. After seeing pictures of the type, it is clear that this species is misplaced in Zammarini as it clearly belongs to the African tribe Platyleurini. This species is very closely related to *Canualna liberiana* (Distant, 1912), a species occurring on the island of São Thomé (M. Villet, personal communication). Distant erroneously thought that São Thomé referred to a location in Brazil, but instead this specimen is almost certainly from the African Island São Thomé, even more so because the collector was “Negreiros”, a painter born on that island. For the above reasons the species is transferred to *Canualna perspicua* (Distant, 1905), new combination.

## Checklist of genera and species currently included within the tribe Zammarini.

In the following check-list only the type locality for each species is given, further distribution records will be discussed in future papers.

**Cicadidae** Latreille, 1802

**Cicadinae** Latreille, 1802

**Zammarini** Distant, 1905

***Odopoea*** Stål, 1861: 616 ; Type species: *Tettigonia dilatata* Fabricius, 1775: 678

*Adusella* (Haupt, 1918: 84)

*Edholmbergia* (Delétang, 1919: 70)

***azteca*** Distant, 1881b: 4 (Mexico)

***cariboea*** Uhler, 1892:169 (Hispaniola)

***degiacomii*** Distant, 1912: 644 (Espírito Santo, Brazil)

***dilatata*** (Fabricius, 1775: 678), *Tettigonia* (Jamaica)

*plena* (Walker, 1850: 38), *Zammara* (Jamaica)



- cuncta* (Walker, 1850: 39), *Zammara* (Jamaica)  
*praxita* (Walker, 1850: 40), *Zammara* (Unknown)  
*erato* (Walker, 1850: 41), *Zammara* (Jamaica)  
*domingensis* (Uhler, 1892: 172), *Odopoea* (Hispaniola)  
***diriangani*** Distant, 1881b: 5 (Chontales, Nicaragua)  
***funesta*** (Walker, 1858: 2), *Zammara* (North America)  
***insignifera*** Berg, 1879: 135 (Salta, Argentina)  
***jamaicensis*** Distant, 1881a: 629 (Jamaica)  
***lebruni*** (Distant, 1906b: 385), *Tettigades* (Patagonia)  
***minuta*** Sanborn, 2007: 2 (Colima, Mexico)  
***signoreti*** Stål, 1864: 59 (Mexico)  
***strigipennis*** (Walker, 1858: 3), *Zammara* (Haiti)  
***suffusa*** (Walker, 1850: 37), *Zammara* (Santo Domingo, [Dominican Republic])  
***vacillans*** (Walker, 1858: 3), *Zammara* (Santo Domingo, [Dominican Republic])  
***venturii*** Distant, 1906c: 150 (Argentina)  
*lebruni* (Delétang, 1919: 16) *Edholmbergia* (Catamarca)  
*signata* (Haupt, 1918: 84) *Adusella* (Catamarca, Argentina)  
***Miranha*** Distant, 1905: 381 ; Type species: *Zammara imbellis* Walker, 1858: 2  
*imbellis* (Walker, 1858: 2), *Zammara* (Mexico)  
***Zammara*** Amyot & Audinet Serville, 1843: 468 ; Type species: *Tettigonia tympanum* Fabricius, 1803: 40  
*brevis* (Distant, 1905: 382), *Orellana* (Colombia)  
*calochroma* Walker, 1858: 4 (Cundinamarca, [Colombia])  
*erna* Schmidt, 1919: 390 (Pucay, Ecuador)  
*eximia* (Erichson, 1848: 616), *Cicada* (*Zammara*) (British Guiana)  
*hertha* Schmidt, 1919: 386 (Chanchamayo, Peru(♂); Canelos, Ecuador (♀))  
*intricata* Walker, 1850: 35 (Puerto Rico)  
*lichyi* Boulard & Sueur, 1996: 106 (Aragua, Venezuela)  
*luculenta* Distant, 1883: 187 (Unknown)  
*medialinea* Sanborn, 2004: 367 (Aragua, Venezuela)  
*nigriplaga* Walker, 1858: 4 (South America)  
*olivacea* Sanborn, 2004: 365 (Providencia, Colombia)  
*smaragdina* Walker, 1850: 33 (Unknown)  
*angulosa* (Walker, 1850: 34), *Zammara* (Mexico)  
*smaragdula* Walker, 1858: 4 (South America)  
*streps* Amyot & Audinet Serville, 1843: 469 (Brazil)  
*tympanum* (Fabricius, 1803: 40), *Tettigonia* (Brazil)  
***Zammaralna***, Boulard & Sueur, 1996: 110 ; Type species: *Zammaralna bleuzeni*, Boulard & Sueur, 1996: 110  
*bleuzeni* Boulard & Sueur, 1996: 110 (Bolívar, Venezuela)  
***Juanaria*** Distant, 1920: 455 ; Type species: *Juanaria mimica* Distant, 1920: 456  
*poeyi* (Guérin-Méneville, 1856: 178), *Cicada* (*Platypleura*) (Cuba)  
*mimica* (Distant, 1920: 456), *Juanaria* (Cuba)  
***Borencona*** Davis, 1928: 31; Type species: *Borencona aguadilla* Davis, 1928: 31  
*aguadilla* Davis, 1928: 31 (Yauco, Puerto Rico)  
***Chinaria*** Davis, 1934: 52; Type species: *Chinaria mexicana* Davis, 1934: 52  
*pueblaensis* Sanborn, 2007: 5 (Puebla, Mexico)  
*mexicana* Davis, 1934: 52 (Morelos, Mexico)  
*similis* Davis, 1942: 178 (Guerrero, Mexico)

- vivianae* Ramos, 1983: 63 (La Estrella, Dominican Republic)
- Orellana** Distant, 1905: 381 ; Type species: *Zammara columbia* Distant, 1881a: 628
- bigibba* Schmidt, 1919: 392 (Brazil)
- brunneipennis*\* Goding, 1925: 27 (El Oriente, Ecuador)
- castaneamaculata* Sanborn, 2010: ? (Magdalena[?], Colombia)
- columbia* (Distant, 1881a: 628), *Zammara* (Medellin, Colombia)
- pulla*\* Goding, 1925: 25 (Ecuador)
- Uhleroides** Distant, 1912: 644; Type species: *Uhleroides cubensis* Distant, 1912: 645
- chariclo* (Walker, 1850: 146), *Cicada* (Cuba)
- cubensis* Distant, 1912: 645 (Cuba)
- hispaniolae* Davis, 1939: 292 (Santo Domingo, [Dominican Republic])
- maestra* Davis, 1939: 291 (Santiago de Cuba, Cuba)
- sagrae* (Guérin-Méneville, 1856: 178), *Cicada* (Cuba)
- samanae* Davis, 1939: 294 (Santo Domingo, [Dominican Republic])
- walkerii* (Guérin-Méneville, 1856: 179), *Cicada* (Cuba)
- \*= generic placement uncertain (possibly in *Zammara*), due to not having seen any (type) specimens.

## Platypleurini Schmidt, 1918

- Canualna* Boulard, 1985: 184; Type species: *Platypleura liberiana* Distant, 1912: 200
- perspicua* (Distant, 1905: 380), *Odopoea* (São Thomé)

## Key to the genera of the tribe Zammarini

Below, the first key to both males and females for all (described) species within the Tribe Zammarini is provided.

There are several genera (*Plautilla* Stål 1865, *Procollina* Metcalf 1963, *Daza* Distant 1905, *Aragualna* Champagnet, Boulard & Gaiani 2000, *Onoralna* Boulard 1996) that are at present placed outside of Zammarini, which may prove to be members of the tribe. Currently molecular data and additional morphological data are being collected for each to help determine their taxonomic position within the Cicadidae.

1. Median (M) and anterior cubital (CuA) vein arising together from the basal cell (Figs 2 left, 4, 5); 2 or 3 tarsomeres, first tarsomere sometimes strongly reduced (Fig. 3)..... **2**
- Median (M) and anterior cubital (CuA) vein arising separately from the basal cell, separated by a distance of at least the width of either vein (Fig. 2 right); 3 tarsomeres, first tarsomere sometimes strongly reduced (Fig. 3 right) ..... **4**
2. Two tarsomeres, first tarsomere sometimes only visible in ventral view (Fig. 3 left)..... **Zammara**
- Three tarsomeres, first tarsomere sometimes only visible in ventral view (Fig 3 right) ..... **3**



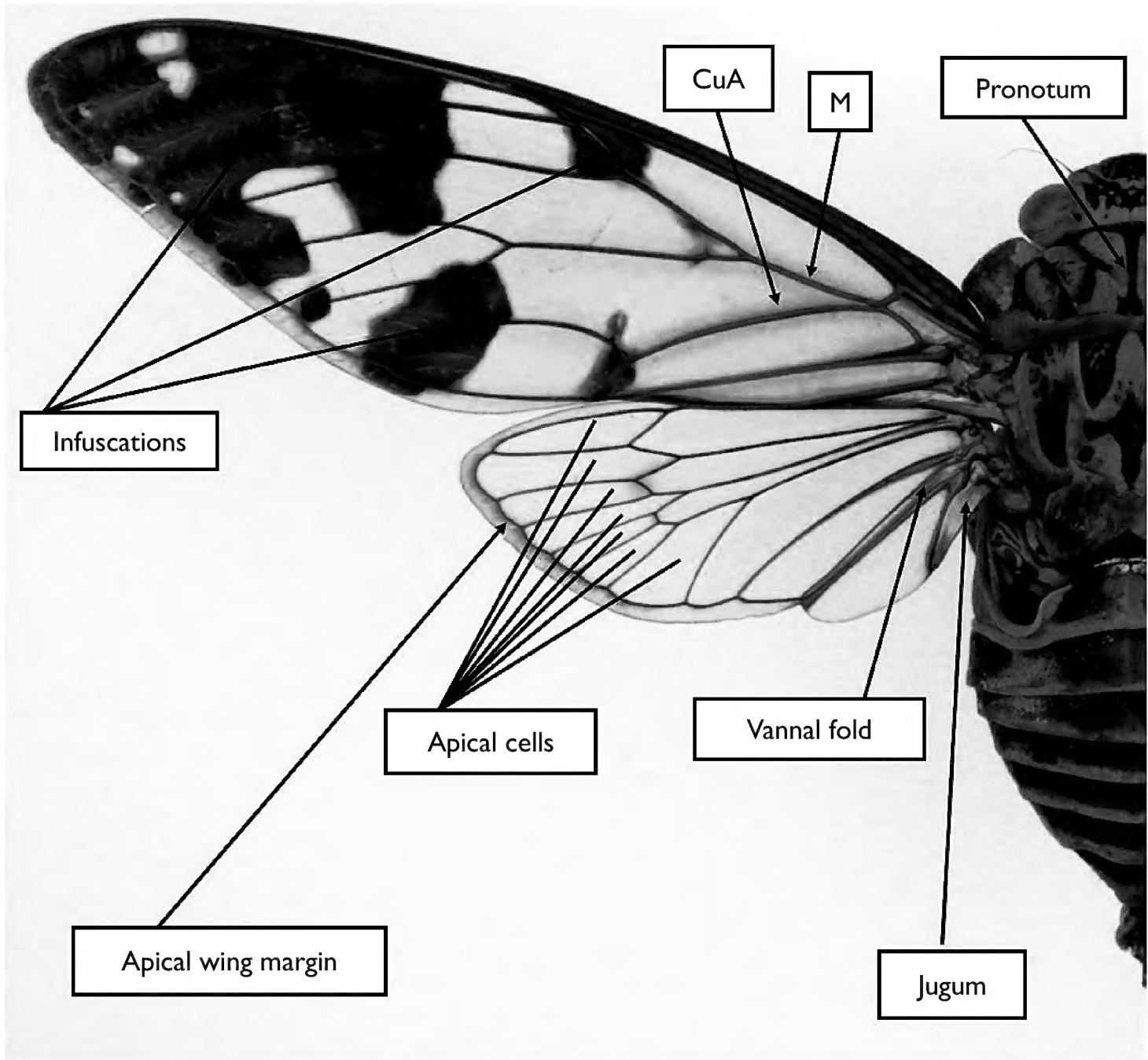
**Figure 2.** CuA and M veins arising together (left) or separate (right) from the basal cell.



**Figure 3.** Presence of 2 (left) or 3 tarsomeres (right).

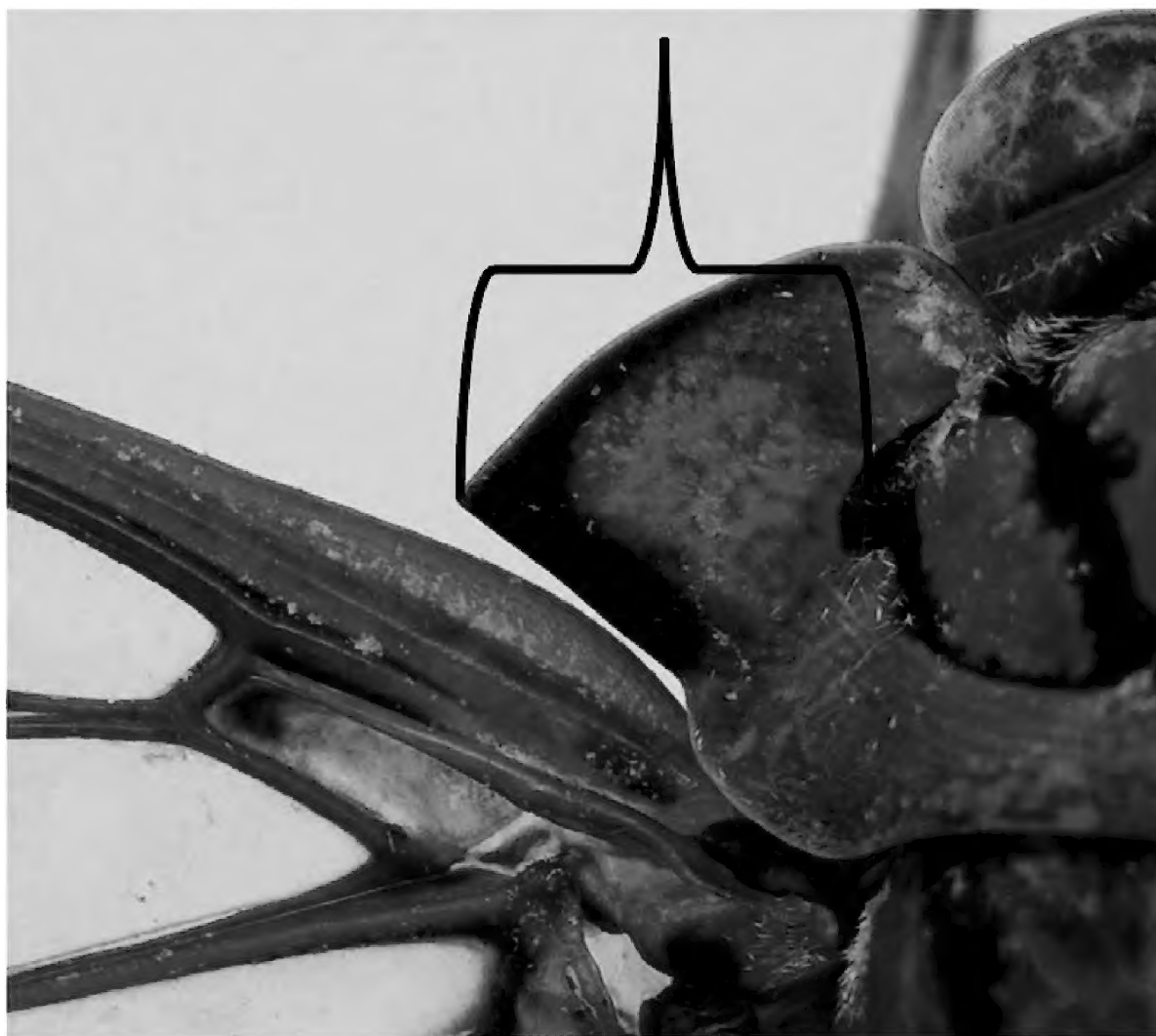
3. M and CuA juxtaposed (Figs 2 left, 5); apical 1/3 to 1/2 of fore wing infuscated with wavy pattern of brown and grayish, basal half transparent.....  
.....*Zammaralna*
- M and CuA juxtaposed or fused (at least at base, Figs 2 left, 4 & 5); fore wing transparent with scattered infuscations or apical part infuscated but not with wavy pattern ..... *Orellana*
4. Both fore and hind wings at least partly infuscated, hind wing sometimes only very small part of apical cells directly bordering apical margin..... 5
- At least hind wing completely transparent, i.e., no infuscation present (except for vannal fold, jugum and apical wing margin in some species) (Fig. 4) .... 8
5. Hind wing completely infuscated; fore wing completely opaque. (Restricted to Cuba) ..... *Juanaria*
- Hind wing not completely infuscated; at least some areas of fore wing transparent ..... 6
6. Infuscations of fore wing restricted to apical 1/3<sup>rd</sup>, infuscations following veins of apical cells; infuscations of hind wing restricted to apical 1/4<sup>th</sup> (and vannal fold)..... *Odopoea* (in part)
- Infuscations present over whole length of fore wing, infuscations less restricted to wing veins; infuscations of hind wing at least present in apical wing margin and part of apical cells directly bordering apical margin ..... 7





**Figure 4.** Hind wing terminology following Moulds (2005).

- 7. Infuscations of hind wing only present in apical wing margin and part of apical cells directly bordering apical margin (and vannal fold). (Restricted to Mesoamerica).....*Miranha*
- Infuscations of hind wing present both at apical wing margin (and vannal fold), and at central internal edges of basal cells. (Restricted to Mexico and Dominican Republic) .....*Chinaria*
- 8. Width of pronotal flange (Fig. 5) less than half diameter of eye (restricted to Cuba, Haiti and Dom. Rep.) ..... *Uhleroides*
- Width of pronotal flange (Fig. 5) at least half diameter of eye ..... **9**
- 9. Veins of fore wing evenly striped; width of pronotum (at widest point, including flanges) more than 1.7 times width of head including eyes. (Restricted to Puerto Rico)..... *Borencona*
- Veins of fore wing evenly colored, not striped; width of pronotum (at widest point, including flanges) less than 1.5 times width of head including eyes....  
..... *Odopoea* (in part)



**Figure 5.** Pronotal flange; bracket indicates width of pronotal flange.

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## References

- Amyot CJB, Audinet Serville JG (1843) *Histoire Naturelle des Insectes. Hemiptères*. Librairie Encyclopédique de Roret, Paris, 675 pp.
- Berg C (1879) Hemiptera Argentina (continuacion), Hemiptera Homoptera Latr. Fam. Cicadidae Westw. *Anales de la Sociedad Científica Argentina* 8: 135–144.
- Boulard M (1975) Les Plautillidae, famille nouvelle d'Homoptères Cicadoidea. *Annali del Museo Civico di Storia Naturale di Genova* 80: 313–318.
- Boulard M (1976) Un type nouveau d'appareil stridulant accessoire pour les Cicadoidea Révision de la classification supérieure de la superfamille [Hom.]. *Journal of Natural History* 10 (4): 399.
- Boulard M, Sueur J (1996) Sur deux nouvelles Zammarini originaires du Vénézuéla (Cicadomorpha, Cicadoidea, Cicadidae). *Ecole Pratique des Hautes Études, Biologie et Évolution des Insectes* 9: 105–112.
- Davis WT (1928) The Cicadas of Porto Rico with a Description of a New Genus and Species. *Journal of the New York Entomological Society* 36 (1): 29–34.
- Davis WT (1934) New Cicadas from North America. *Journal of the New York Entomological Society* 42 (1): 37–63.
- Davis WT (1939) New cicadas from North America and the West Indies. *Journal of the New York Entomological Society* 47 (4): 287–302.
- Davis WT (1942) Notes on cicadas with descriptions of new species. *Journal of the New York Entomological Society* 50: 169–186.
- Delétang LF (1919) Contribución al estudio de los cicádidos (Cicadidae) argentinos (Hemiptera-Homoptera) ensayo filogénico. *Anales de la Sociedad Científica Argentina* 88: 25–94.
- Distant WL (1881a) XXXIX. Descriptions of new species belonging to the Homopterous family Cicadidae. *Trans Entomological Society London* 1881: 627–631.
- Distant WL (1881b) Rhynchota: Homoptera. In: *Biologia Centrali-Americana; contributions to the knowledge of the fauna and flora of Mexico and Central America*. Published for the editors by Dulau, London, 1–16.
- Distant WL (1883) Contributions to a proposed monograph of the homopterous family Cicadidae. Part I. *Proceedings of the Zoological Society of London* 1883:187–194.
- Distant WL (1905) Rhynchotal notes. – XXXI. *Annals and Magazine of Natural History* 15 (7): 379–387.
- Distant WL (1906a) A synonymic catalogue of Homoptera. Part 1. Cicadidae. Printed by order of the Trustees, London, 207 pp.
- Distant WL (1906b) Some undescribed species of Cicadidae. *Annals and Magazine of Natural History* 7 (17): 384–389.
- Distant WL (1906c) Undescribed Cicadidae. *Annales de la Société entomologique de Belgique* 50:148–154.
- Distant WL (1912) New genera and species of Rhynchota (Homoptera). *Annals and Magazine of Natural History* 9 (8): 640–652.
- Distant WL (1914) Homoptera, fam. Cicadidae, subfam. Gaeaninae. *Genera Insectorum* 158: 1–38.

- Distant WL (1920) Description of a new genus and species of Cicadidae from Cuba. *Annals and Magazine of Natural History* 6 (9): 455–456.
- Erichson WF (1848) Homoptera. In: Schomburgk R (Ed) *Reisen in Britisch-Guiana in den Jahren 1840–1844 im auftrag Sr. Mäjestat des Königs von Preussen ausgeführt von Richard Schomburgk. Nebst einer Fauna und Flora Guiana's nach Vorlagen von Johannes Müller, Ehrenberg, Erichson, Klotzsch, Troschel, Cabanis und andern.* Weber, Leipzig, 533–1260.
- Fabricius JC (1775) Rhyngota. In: *Systema entomologiae: sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus.* In *Officina Libraria Kortii, Flensbvirgi et Lipsiae*, 816 pp.
- Fabricius JC (1803) Rhyngota. In *Systema rhyngotorum: secundum ordines, genera, species: adiectis synonymis, locis, observationibus, descriptionibus* C. Reichard. *Brunsvigae*, 101 pp.
- Goding FW (1925) Synopsis of the Cicadidae of Ecuador. *Revista del Colegio nacional Vicente Rocafuerte* 7: 1–34.
- Guérin-Méneville (1856) Segunda, Seccion. Homopteros. In *Crustaceos, Aragnides, e Insectos. Historia fisica politica y natural de la Isla de Cuba, por D. Ramon de la Sagra. Segunda Parte Historia Natural.* 7: 1–868.
- Haupt H (1918) Neue Homoptera aus dem Provinzial-Museum Hannover. *Stettiner Entomologische Zeitung* 79: 82–94.
- Jacobi A (1907) Homoptera Andina. Die Zikaden des kordillerengebietes von Südamerika nach Systematik und Verbreitung. I. Cicadidae. *Abhandlungen und Berichte des Königlichen Zoologischen und Anthropologisch-Ethnographischen Museums zu Dresden* 11: 1–28.
- Kato M (1932) *Monograph of Cicadidae.* San Sei Do, Tokyo, 450 pp. [In Japanese but partly supplemented by English].
- Latreille PA (1802) *Histoire naturelle, générale et particulière des Crustacés et des Insectes. Ouvrage faisant suite aux oeuvres de Laclerc de Buffon et partie du cours complet d'Histoire naturelle rédigé p. C.S. Sonnini.* Paris: Dufart. 3, Familles naturelles et genres. xii, 467 pp.
- Metcalf ZP (1963) General Catalogue of the Homoptera Fascicle VIII, Cicadoidea. Part 1. Cicadidae. Section 1, Tibiceninae North Carolina State College [now University], Raleigh, 586 pp.
- Moulds MS (2001) A review of the tribe Thophini Distant (Hemiptera: Cicadoidea: Cicadidae) with the description of a new species of *Thopha* Amyot & Serville. *Insect Systematics & Evolution* 32 (2): 195–203.
- Moulds MS (2005) An appraisal of the higher classification of cicadas (Hemiptera: Cicadoidea) with special reference to the Australian fauna. *Records of the Australian Museum* 57: 375–446.
- Ramos JA (1983) Sinopia de las cigarras de la República Dominicana (Cicadoidea, Homoptera-Auchenorrhyncha). *Caribbean Journal of Science* 19: 61–70.
- Sanborn AF (2004) Two new *Zammara* species from South America (Hemiptera: Cicadomorpha: Cicadidae). *Florida Entomologist* 87 (3): 365–371.
- Sanborn AF (2007) New species, new records and checklist of cicadas from Mexico (Hemiptera: Cicadomorpha: Cicadidae). *Zootaxa* (1651): 1–42.

- Sanborn, AF (in press) The cicadas of Colombia including new records and the description of a new species (Hemiptera: Cicadoidea: Cicadidae). *Journal of Natural History*.
- Schmidt E (1919) Beitrag zur Kenntnis der Genera *Zammara* Amyot et Serville und *Orellana* Distant (Rhynchota-Homoptera). *Stettiner Entomologische Zeitung* (80): 383–394.
- Stål C (1861) Genera nonnulla nova cicadinorum. *Annales de la Société entomologique de France*, 1 (4): 613–622.
- Stål C (1864) Hemiptera mexicana enumeravit, species que novas descripsit (continuatio). *Stettiner Entomologische Zeitung*. 25: 49–86.
- Torres BA (1945) Revisión de los géneros *Chonosia* Dist. *Mendozana* Dist. Y *Derotettix* Berg y algunas interesantes notas cicadidológicas. (Homoptera-Cicadidae). *Notas del Museo de La Plata* 10: 55–82.
- Uhler PR (1892) Preliminary survey of the Cicadidae of the United States, Antilles, and Mexico. *Transactions of the Maryland Academy of Sciences* 1: 147–175.
- Van Duzee EP (1915) A Preliminary Review of the West Coast Cicadidæ. *Journal of the New York Entomological Society* 23 (1): 21–44.
- Walker F (1850) List of the Specimens of Homopterous Insects in the Collection of the British Museum, Part I. Printed by order of the Trustees, London, 260 pp.
- Walker F (1858) Supplement. List of the Specimens of Homopterous Insects in the Collection of the British Museum. Printed by order of the Trustees, London, 369 pp.